Ms. Jeanne Townsend
Clerk to the Board
State Water Resources Control Board
P.O. Box 100
Sacramento, California 95814-0100

RE: EPA's comments on the Bay-Delta Water Quality Control Plan; Phase I; SED

Dear Ms. Townsend,

The U.S. Environmental Protection Agency (EPA) appreciates the opportunity to review the State Water Resources Control Board's (State Board's) *Public Draft Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary: San Joaquin River Flows and Southern Delta Water Quality,* (SED), released on 31 December 2012. Once the State Board concludes this process, EPA will review any new or revised water quality standards pursuant to Clean Water Act §303(c).

We urge the State Board to expeditiously adopt and implement updates to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta WQCP).[1] The benefits of increasing freshwater flows can be realized quickly and help recover struggling fish populations. EPA respectfully submits the following observations and recommendations regarding the SED:

1. EPA supports State Board's efforts to enhance freshwater flows for aquatic life protection as part of a multi-phase, interagency effort to address resource degradation in the San Joaquin River basin.

Multiple stressors are impacting aquatic life and degrading water quality across the Bay Delta ecosystem.[2] These stressors include insufficient freshwater flow, conversion and fragmentation of floodplains and wetlands, discharge of contaminants into surface waters, introduction and spread of invasive species and the resulting alteration of food webs, and degradation of aquatic habitat through high instream water temperatures and low levels of dissolved oxygen.

[1] State Water Resources Control Board, 13 December 2006, Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, (Bay-Delta WQCP).
[2] See EPA's December 11, 2012 letter to the State Board Re: The Comprehensive Review of the Bay-Delta Water Quality Control Plan. Available at:
http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/comments121212/karen_schwinn.pdf

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The State Board, in its Strategic Plan, has articulated a valid approach to considering flows and other stressors affecting the Bay Delta ecosystem,[3] and has recognized that freshwater flows must be increased if resident and migratory fish populations are to be protected.[4] The State Board correctly concluded that "*[a]lthough flow modification is an action that can be implemented in a relatively short time in order to improve the survival of desirable species and protect public trust resources, public trust resource protection cannot be achieved solely through flows – habitat restoration also is needed...One cannot substitute for the other; both flow improvements and habitat restoration are essential to protecting public trust resources.*"[5] Other actions by the Water Board and other agencies are already underway addressing contaminants and restoring habitat. It is essential that the State Board act and use its authorities to address the stressors that it can.

2. EPA recommends strengthening the proposed narrative fish and wildlife objective with greater definition and extending year-round protection to aquatic life.

We recommend strengthening the draft narrative fish and wildlife objective and clarifying its relationship to the existing narrative salmon-doubling objective in the Bay-Delta WQCP. The draft narrative objective can be strengthened by replacing vague language with measurable performance targets and applying it to all months of the year. Clear definitions and performance targets are necessary for establishing an effective objective and allow for evaluation of attainment of the objective in the future. A standard "*express(es) or establish(es) the desired condition...or instream level of protection for waters of the United States...*"[6] The term "viable", for example, is subject to wide variation of interpretation which minimizes the clarity and effectiveness of the objective. Measurable performance targets should be established for "*viable*", and the "*abundance, spatial extent or distribution, genetic and life history diversity, migratory pathways and productivity.*"[7] Similarly, we recommend removing the vague phrase "*other reasonably controllable measures in the San Joaquin River watershed*" from the objective and relocating it in preface material that establishes the context for multiple stressors in the lower San Joaquin River watershed. Including this phrase in the objective defers, to future discussions, determinative decisions about what, if anything, should be done about freshwater flows and other stressors affecting the San Joaquin River.

The proposed objective should be applied year round. Protecting the "viability" of fish

[3] State Water Resources Control Board; Strategic Plan 2008-2012 http://www.waterboards.ca.gov/water_issues/hot_topics/strategic_plan/2007update.shtml

[4] "*The best available science suggests that current flows are insufficient to protect public trust resources.*" Page 2 and "*The public trust resources...include those resources affected by flow, namely, native and valued resident and migratory aquatic species, habitats, and ecosystem processes.*" Page 10 in State Water Resources Control Board, 3 August 2010, Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem Prepared Pursuant to the Sacramento-San Joaquin Delta Reform Act of 2009, (2010 Flows Report), available at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf

[5] 2010 Flows Report, p. 7.

[6] Environmental Protection Agency, October 2012, What is a New or Revised Water Quality Standard Under CWA 303(c)(3)? – Frequently Asked Questions, EPA Publication 820F12017. 4pp. available at http://water.epa.gov/scitech/swguidance/standards/cwa303faq.cfm

[7] State Water Resources Control Board, December 2012, Public Draft Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary: San Joaquin River flows and Southern Delta Water Quality (SED), Appendix K, Table 3, p. 1.

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populations involves protecting all of their life stages; native migratory fish are present throughout the San Joaquin River watershed in all months of the year. While the proposed program of implementation currently focuses on flow-related actions in specific seasons, the broad goal of the narrative objective—viable populations of native migratory fish—is a year round goal.

The status of the existing *salmon-doubling* objective[8] for the San Joaquin River and its relationship to the proposed objective is unclear in the SED. We recommend providing a redline/strike-out version of the Bay-Delta WQCP to show that the narrative salmon-doubling objective will remain as an objective in the Bay-Delta WQCP after this update. The intended relationship between the proposed narrative objective and the salmon-doubling objective should be explicitly described in the final SED.

3. The proposed flows do not appear to be substantially different from existing flows.

The preferred alternative identified in the SED includes a 35% unimpaired flow (UF) target at the mouths of the Stanislaus, Merced, and Tuolumne Rivers (February to June) and baseflows at Vernalis of 1,000 cubic feet per second (cfs) (February to June). The State Board's approach results in less than 35% UF at the downstream point of Vernalis because no flow requirements are proposed for the upper San Joaquin River, which contributes a significant amount of the unimpaired flow but less of the actual observed flow. In the SED, the State Board appropriately proposes flows for the three major tributaries proportional to their historical and ecologically appropriate contributions, but does not provide an adequate rationale for excluding the upper San Joaquin River itself.

Analyses summarized in the SED predict that, in an average year, proposed freshwater flows will increase in the Tuolumne and Merced Rivers by ~20 percent (February to June), decrease in the Stanislaus River by 7 percent, and increase at Vernalis by 8 percent relative to baseline.[9] The decrease in the Stanislaus River is concerning because as described in Appendix L, the proposed flows in the Stanislaus would be less than those specified by the federal National Marine Fisheries Service (NMFS) under a "jeopardy" Biological Opinion issued to prevent the extirpation of salmon populations caused by the operation of the Central Valley Project and State Water Project.[10] Fortunately, the requirements in the Biological Opinion would still be in effect and supercede the 35 percent UF requirement. However the percent of UF selected by the State Board should strive for a higher goal if the WQCP is to aid the recovery of sensitive species

[8] Bay-Delta WQCP, Table 3, pp. 14

[9] SED, Table 20-2, pp. 20-5

[10] "Additionally, the National Marine Fisheries Service biological opinion Stanislaus River reasonable and prudent alternative, including Action 3.1.3 (NMFS BO) flows required on the Stanislaus River are included in the baseline. However, these flows are not included in the WSE modeling of the LSJR alternatives, including the Preferred LSJR Alternative. Instead, the WSE modeling of the LSJR alternatives assumes that a certain percent (i.e., 35 percent) of unimpaired flow would be met. As a result, when the WSE model results are compared to baseline, the modeling shows some flow reductions in the Stanislaus River. However, because the LSJR alternatives would not directly result in any changes to the NMFS BO flow requirements on the Stanislaus River, actual reductions in flows below the NMFS BO flows would be unlikely." SED, pp. 20-5 which refers to the National Marine Fisheries Service, June 2009. Endangered Species Act Section 7 Consultation. Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project. Additional analysis of how much less flow is provided by the proposed alternative than the NMFS BO is conducted in the SED's Appendix L: Sensitivity Analysis.

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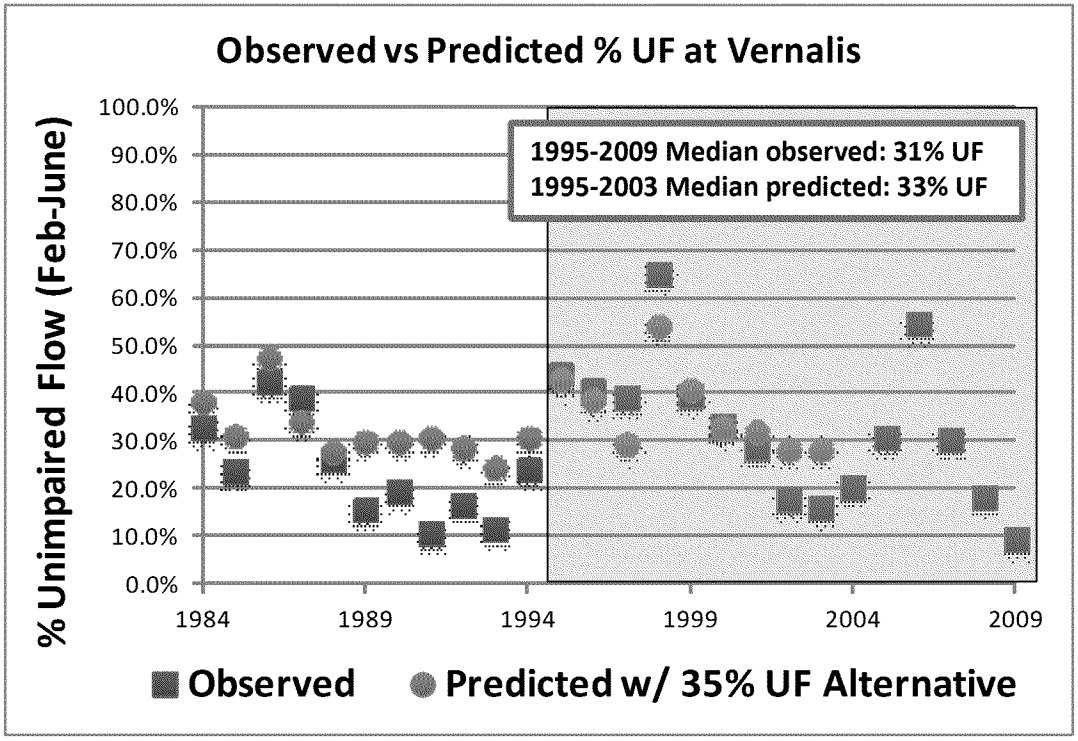
populations. Considering all of the other stressors on these species, Pprescribing a flow lower than what is needed is likely only to delay extirpation.

In order to understand how the predicted increases and decreases in flows in the tributaries translate at the lowest point in the watershed, through which fish from all the tributaries must migrate, EPA calculated the median percentage of UF that would reach Vernalis under the proposed flow scenario and compared it to observed flows.



EPA looked at the time frame after 1995, when the last major changes to flow standards were made in the Bay-Delta WQCP. The median of observed and predicted flows under the 35% UF alternative were calculated from 1995 to the date of last available data in the SED. The median of the observed flows is 31.0%, whereas the median of predicted flows median under the 35% UF alternative is 32.8%.[11] The proposed alternative flows do not appear to translate into meaningful protections for aquatic life compared to existing conditions. EPA could not find a stated margin of error on the Water Supply Effects model used in the SED; nonetheless, this minor increase in flow predicted at Vernalis is likely within the margin of error of the model.

According to the U.S. Fish and Wildlife Service (FWS),[12] the NOAA Fisheries Service (NMFS),

[11] EPA used observed flow and unimpaired flow at Vernalis from Tables 2.6 and 2.5 on pp. 2-17 and 2-16 in Appendix C of the SED. The values for the modeled flows at Vernalis under the proposed 35%UF scenario were obtained from column MG in the "Alt%WSEResults" tab in the spreadsheet titled "WSE_Model_12312012" which was provided along with the SED for public comment and is available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2012_sed/docs/wse_model_econoutput_12312012.zip; last accessed 03/13/13.

[12] "Interior remains concerned that the San Joaquin Basin salmonid populations continue to decline and believes that flow increases are needed to improve salmonid survival and habitat." USFWS May 23, 2011 Phase I Scoping Comments, available at:

[13] and the California Department of Fish and Wildlife (DFW),[14] existing conditions are not protecting aquatic life. All three agencies identified salmon and steelhead populations as declining under current flow conditions. Furthermore, EPA found that existing temperature conditions, which are heavily influenced by flow, are not adequate to support salmonids in several segments of the lower San Joaquin River and its lower tributaries.[15]

4. The proposed 35% UF may be too low to provide essential ecological functions.

EPA is concerned the proposed flows will not provide essential ecological functions such as the adequate variability of flows, adequate magnitude of flows, and adequate tributary baseflows that a natural hydrograph can provide. While reproducing the natural variability in flow is a potential ecological benefit of using an approach based on a percentage of UF, a great deal of that variability is lost when one moves from a 3-day average to a 14-day average;[16] valuable peaks and troughs in flow are lost with the longer averaging period. In the past, DFW has recommended a 3-day average with a 3-day lag[17] and the feasibility of this or a similar alternative should be evaluated in the SED.

We understand the need to prevent flooding; however the caps on flow proposed in the SED limit the benefits of high water years to aquatic life. Among others, these benefits include flushing of gravels used for spawning and the creation of nursery habitat for juveniles in floodplains. These caps, which are ostensibly to protect against flooding, are set at the median unimpaired flows in each of the tributaries, which is a metric unrelated to flooding and well below the flood control capacity.[18] The caps are the equivalent of 31 percent of flood control capacity on the Stanislaus, 23 percent of capacity on the Tuolumne and 33 percent of capacity on the Merced.[19] They should be reevaluated because they allow for the delivery of less than 35 percent UF at times when there is no risk of flooding.

EPA urges State Board to allow the first large storm, or some representative selection of storms, to pass though the system largely unimpaired.[20] This will help restore some of the natural

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http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts052311/amy_aufdemberge.pdf

[13] "Inadequate flow to support fish and their habitats is directly and indirectly linked to many stressors in the San Joaquin river basin and is a primary threat to steelhead and salmon." NMFS February 4, 2011 Phase I Scoping Comments, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts020811/010411dpowell.pdf

[14] "…current Delta water flows for environmental resources are not adequate to maintain, recover, or restore the functions and processes that support native Delta fish." Executive Summary in 2010 CDFG Flow Criteria.

[15] See EPA's listing of several segments in the lower San Joaquin River and the Tuolumne, Merced and Stanislaus as impaired by temperature per CWA §303(d), Final Decision Letter on California's 2008-2010 §303(d) List of Impaired Waters issued October 11, 2011 and available at: http://www.epa.gov/region9/water/tmdl/california.html

[16] Grober, Les and Rich Satkowski, State Water Resources Control Board, presentation at a UC Davis Center for Aquatic Biology and Aquiculture (CABA) Seminar, January 18, 2013, slides 24-27 http://deltacouncil.ca.gov/sites/default/files/documents/files/CABA_Grober_and_Satkowski.pdf

[17] pp 23; http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts020811/010711cdibble.pdf

[18] SED, Appendix C, pp. 5-4.

[19] SED, Appendix F, pp.F.1-32 indicates flows will be capped at 2,500 cfs on the Stanislaus, 3,500 cfs on the Tuolumne and 2,000 cfs on the Merced, yet SED, Figure 6-3 and Table 6-3 indicate that the California Department of Water Resources believes the flood capacity is 8,000 cfs on the Stanislaus, 15,000 cfs on the Tuolumne and 6,000 cfs on the Merced.

[20] Dahm, Cliff, University of New Mexico, presentation titled "Examples of Managed Flow Regimes - Possible Models for the

amplitude of flow events and hydrogeomorphic conditions on the river that are essential for healthy plant and animal populations. As currently proposed, the State Board's approach to adaptive management allows for shifting of flows from one time period to another and thereby would allow for the Coordinated Operations Group (COG) to send a pulse flow or storm event flow down the system. However, such a small total volume of water is available for management in the February to June period that the COG would not be able to generate a pulse flow of the magnitude recommended by DFW and have sufficient water volume available to keep reasonable baseflows in the system for the remainder of the flow window.[21]

The Independent Science Board for the Delta emphasized the importance of combining a percentage of UF approach with other measures such as tributary-specific, minimal flow crtieria.[22] In their 2010 Flow Criteria Report, DFW recommended criteria for the recovery of fall-run Chinook salmon comprising 1,500 cfs at Vernalis (January to mid-June) in critical years, with increasing stepwise recommendations reaching 6,314 cfs in wet years.[23] These recommended baseflows from DFW are well above the baseflow proposed by the State Board in the SED (1,000 cfs at Vernalis). As summarized in Chapter 3 of the SED, in critical and dry years, the flows proposed by the State Board meet neither the criteria recommended by DFW[24] nor flows recommended by FWS.[25] The State Board should re-evaluate the proposed baseflow and ensure protection for aquatic life during critical and dry years.

5. The proposed percentage of UF is significantly lower than UF standards adopted elsewhere in the United States and internationally.

Prominent scientists recommend implementing freshwater flow prescriptions for rivers and estuaries that mimic the pattern of the natural hydrographs, in order to protect aquatic species with life histories adapted to such flow patterns.[26] However, the flows proposed by the State Board under the UF approach described in the SED are significantly lower than flow standards resulting from the use of the UF approach elsewhere. Richter et. al.[27] studied rivers in Florida, Michigan, Maine, and the European Union and found that the cumulative allowable depletion of

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Delta?" at a UC Davis Center for Aquatic Biology and Aquiculture (CABA) Seminar, January 18, 2013, states that it is better to "retain *certain floods at full magnitude and to eliminate others entirely than to preserve all or most floods at diminished levels*." http://deltacouncil.ca.gov/sites/default/files/documents/files/CABA_Dahm.pdf

[21] See DFW testimony on 3/20/13.

[22] "*Worldwide, research is indicating that the percent of impaired flow should be used together with other criteria. Variability in flow, tributary-specific minimal critical flows (i.e., thresholds) and flow targets need further consideration. In particular, the combined importance of higher and more variable flows in the spring, and variables such as the timing of flows and the rate of change in flow, which have been demonstrated to provide important cues to fish and other wildlife, should be further evaluated.*" Delta Independent Science Board May 22, 2012 letter to Les Grober, Re: Flow Criteria that use Precent of Unimpaired Flow http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/item8_att2_delta_isb_response.pdf

[23] California Department of Fish and Game, November 23, 2010, Quantifiable Biological Objectives and Flow Criteria for Aquatic and Terrestrial Species of Concern Dependent on the Delta (CDFG Flow Criteria), p. 105

[24] SED, pp. 3-12 – 3-13 and Figure 3-2

[25] SED, pp. 3-18 – 3-20 and Figure 3-6

[26] "*Major researchers involved in developing ecologically protective flow prescriptions concur that mimicking the unimpaired hydrographic conditions of a river is essential to protecting populations of native aquatic species and promoting natural ecological functions*". (Sparks 1995; Walker et al. 1995; Richter et al. 1996; Poff et al. 1997; Tharme and King 1998; Bunn and Arthington 2002; Richter et al. 2003; Tharme 2003; Poff et al. 2006; Poff et al. 2007; Brown and Bauer 2009). SED. Appendix C, p. 116

[27] Richter, B. D., Davis, M., Apse, C., and Konrad, C. P. 2011. A presumptive standard for environmental flow protection. River Research and Applications. DOI: 10.1002/rra.1511. http://eflownet.org/downloads/documents/Richter&al2011.pdf

flows ranged from 6 - 20 percent year-round or in low-flow months (maintaining the equivalent of 80-94 percent UF); and 20-35 percent in higher flow months (maintaining the equivalent of 65-80% UF). These scientists recommended ensuring the equivalent of no less than 90 percent UF to achieve a high level of ecological protection, and no less than 80 percent UF to achieve a moderate level of ecological protection. They concluded that alterations below an 80 percent UF threshold "*will likely result in moderate to major changes in natural structure and ecosystem functions*."

6. The State Board's proposed flows fall short of recommended targets to protect fall-run Chinook salmon

In 2010, the State Board identified three flow criteria for the San Joaquin River at Vernalis for halting declines and rebuilding fish populations.[28] These recommendations included a 60 percent UF (14-day average; February through June), the existing Bay-Delta WQCP flow objective for October, and an October pulse flow of 3,600 cfs (10-day minimum) to "*provide adequate temperature and DO conditions for adult salmon upstream migration, to reduce straying, improve gamete viability, and improve olfactory homing fidelity*.[29] These recommendations were identified as "Class A," meaning there was more robust scientific information to support specific numeric criteria than some other recommendations.

As noted in #3 above, since the 35 percent UF proposed in the SED would be achieved in the tributaries but not at Vernalis, the flow at Vernalis is expected to be lower.[30] The flows proposed in the SED almost halve the 60 percent UF that the State Board previously concluded was necessary to protect fall-run Chinook salmon, and disregard the recommendation for "Class A" pulse flows in the fall. DFW's flow recommendations for fall-run Chinook salmon are also not met by the proposed alternative, as described in #4 above and also discussed in their testimony to the State Board on March 20th 2013.

FWS identified flow targets[31] necessary to meet the doubling objective[32] for fall-run Chinook salmon in the Bay-Delta WQCP. The State Board does not analyze how frequently the 35 percent UF alternative in the SED meets these flow targets; however, the 40 percent UF alternative (which would restore 14 percent more flow than the proposed alternative) only meets these recommendations in 42 percent of modeled years.[33] In his external peer review, Dr. Olden raised the concern that "*the rationale for examining 20-60% of unimpaired flow as the only scenarios is questionable, and it needlessly limits a full investigation of the flows required to achieve fish and wildlife beneficial use.*"[34] FWS recommended "*that a block of water should be*

[28] 2010 Flows Report, pp. 119-123

[29] 2010 Flows Report, pp 121

[30] SED, Appendix C and F

[31] United States Fish and Wildlife Service, September 27, 2005, Recommended Streamflow Schedules To Meet the AFRP Doubling Goal in the San Joaquin River Basin (FWS 2005), pp. 27 available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/sjrf_spprtinfo/afrp_2005.pdf

[32] "*Water quality conditions shall be maintained, together with other measures in the watershed, sufficient to achieve a doubling of natural production of Chinook salmon from the average production of 1967-1991, consistent with the provisions of State and federal law*." Bay-Delta WQCP, Table 3, pp. 14.

[33] SED, Figure 3-6, page 3-20, graph shows the flows are met in 33 out of 79 modeled years.

[34] "*Given the choice of scenarios to report (20-60% of unimpaired flow) is based on TBI/NRDC analysis suggesting 5,000 cfs threshold for salmon survival (p. 3-48) and that >50% is estimated to be needed to achieve doubling of salmon production,*

allocated in each of the tributaries to manage flows on a daily basis so that water temperatures do not exceed 65F in the uppermost 5-mile reach between July 1 and mid October when the pulse flows begin."[35] The flows the State Board proposes do not implement this latter recommendation as it falls outside the selected time frame for the objective.

7. The State Board's proposed flows do not protect all life stages of sensitive species.

The proposed narrative objective is written to protect "*native migratory San Joaquin River fish populations*" yet the proposed 35 percent UF is inconsistent with the protection of the existing migratory fish in the basin. The proposed flows are restricted to the February to June timeframe, and are currently based upon the biological needs and certain life stages of only a single species, fall-run Chinook salmon. The SED recognizes other sensitive species, such as steelhead, and other life stages of fall-run Chinook salmon exist in the San Joaquin River watershed outside the proposed February to June window.[36] For example, the SED states that fall-run Chinook salmon in the San Joaquin River watershed migrate October thru December, and spawn between November and January; and, steelhead rear in the watershed for 1 to 3 years before migrating.[37]

The SED clearly identifies the deficiencies in the timeframe of the proposed flows for steelhead as it states that "although water temperatures for rearing steelhead would be improved in June, especially in the Tuolumne River, the benefits would likely be limited because the extent of suitable rearing habitat would continue to be limited by late summer water temperatures."[38] Although the SED analyzes the impact of proposed freshwater flows on water temperatures, it does not compare potential instream temperatures against EPA's recommended temperature criteria[39] for the selected 35 percent UF alternative.[40] The analysis for the 40 percent UF alternative (which is 14 percent more flow than the proposed alternative), shows than in an average year the temperature would exceed EPA's recommended temperature criteria during six to nine months of the year depending on location.[41] The SED also concludes that in an average year, under the 40 percent UF alternative, lethal temperatures would be reached for salmon in September on the Stanislaus, Tuolumne, and Merced Rivers; and in August, September, and October in the lower San Joaquin River.[42] These timeframes, however, are not included in the analysis of the proposed flows, which are restricted to February to June.

Flows provided for salmon during the spring rearing cycle would not help populations decimated by lethal temperatures during the fall migration and spawning. EPA concurs with the external

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implies that the Technical Report is only considering potential flow schedules that may lead to salmon survival at current low levels and not salmon recovery into the future. Therefore, the rationale for examining 20-60% of unimpaired flow as the only scenarios is questionable, and it needlessly limits a full investigation of the flows required to achieve fish and wildlife beneficial use." p. 8 of Dr. Julian Olden's November 15, 2011 External Peer Review of "Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives."
http://www.waterboards.ca.gov/water_issues/programs/peer_review/docs/sanjoaquin_river_flow/olden_pr.pdf

[35] FWS 2005, pp. 14-15

[36] SED pp. 7-14 - 7-18

[37] SED pp. 7-14 - 7-18

[38] SED, pp. 7-93

[39] Environmental Protection Agency (EPA), 2003. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002. Region 10 Office of Water, Seattle, WA.

[40] SED, Chapter 20

[41] SED, pp. 7-95 - 7-96

[42] SED pp. 7-95 - 7-96

peer reviewer Dr. Olden's comments that, by focusing on the spring months, the State Board is not fully accounting for the "range of ecologically-important flow events that occur over the entire year that are critical for salmon persistence and sustained productivity."[43]

The SED's Water Supply Effects model assumes that water diverters and dam operators will not modify their behavior in July thru January to compensate for the new flow requirements. Experience in the system indicates that this assumption is flawed. The State Board should analyze in the SED the indirect impacts of the proposed alternative to flow and aquatic life during the remainder of the year. Additionally, to safeguard against these indirect impacts, the State Board should provide adequate flows on a year round basis to protect aquatic life in all their life stages.

8. The State Board should ensure proposed flows are protective downstream.

The State Board proposes to address downstream aquatic life uses in Phase 2 of the updates to the Bay-Delta WQCP. Flow levels established during Phase 1, however, will influence the ability of the State to achieve Phase 2 goals. The State Board should consider the impact of proposed flows on downstream uses at this time, or create a provision for reconsidering flow levels established during Phase I so adjustments can be made consistent with Phase 2 decisions.

The ability of salmonids to migrate outbound past Vernalis, through the Delta and to the ocean—as well as make a return journey—is essential to achieving sustainable populations and is recognized as part of the goal of the proposed narrative objective.[44] Most of the freshwater from the San Joaquin River is diverted either upstream or as it enters the Delta. This creates a condition whereby almost 40 kilometers of San Joaquin River channels contain water primarily from the Sacramento River in almost all months of almost all years.[45] This discontinuity between the San Joaquin River and the Pacific Ocean adversely affects the migratory ability of salmon and steelhead due to the absence of physical and chemical cues.[46] Increased flows are needed in the San Joaquin River basin to overcome this discontinuity, and if the problem cannot be adequately addressed now in Phase 1, then it must be revisited in Phase 2.

Similarly, the SED does not analyze the effects of the proposed flows and salinity objectives on achieving existing objectives in impaired downstream river segments, e.g., attaining the dissolved oxygen objective in Old and Middle Rivers and complying with the Total Maximum Daily Load (TMDL) in the Stockton Deep Water Ship Channel[47] through which salmon must

[43] *"In summary, although I agree that a fixed monthly prescription is not useful given spatial and temporal variation in runoff (p. 3-52), the Technical Report does not account for the range of ecologically- important flow events that occur over the entire year that are critical for salmon persistence and sustained productivity*." p. 7 of Dr. Julian Olden's November 15, 2011 External Peer Review of "Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives." http://www.waterboards.ca.gov/water_issues/programs/peer_review/docs/sanjoaquin_river_flow/olden_pr.pdf

[44] *"Maintain flow conditions from the San Joaquin River Watershed to the Delta at Vernalis, together with other reasonably controllable measure in the San Joaquin River Watershed, sufficient to support and maintain the* ***natural production of viable native San Joaquin River watershed fish populations migrating through the Delta****."* Emphasis added, SED Appendix K, pp. 1

[45] Fleenor, William et al., February 15, 2010, On developing prescriptions for freshwater flows to sustain desirable fishes in the Sacramento-San Joaquin delta, available at: http://watershed.ucdavis.edu/pdf/Moyle_Fish_Flows_for_the_Delta_15feb2010.pdf

[46] Mesick, Carl, 2001. The Effects of San Joaquin River Flows and Delta Export Rates During October on the Number of Adult San Joaquin Chinook Salmon that Stray. Fish Bulletin 179 – Contributions to the Biology of Central Valley Salmonids: Volume 2. pp. 139-162. Available at: http://www.dfg.ca.gov/fish/REsources/Reports/Bulletin179_V2.asp, see also 2010 Flows Report pp. 55-56

[47] Central Valley Regional Water Quality Control Board's San Joaquin River Dissolved Oxygen TMDL was approved by US

pass. Recent provisional data from the Stockton Deep Water Ship Channel indicates that dissolved oxygen problems can arise in the fall at flows below 2,600 cfs.[48] The State Board should carefully analyze the recommendation for baseflows of 1,000 cfs at Vernalis and its impact on meeting the dissolved oxygen objective in downstream waters.

9. The State Board should analyze the potential impacts of relaxing the salinity objective on Delta hydrodynamics

The proposed seasonal salinity numerical objectives at four compliance points in the southern Delta would change an existing objective of 0.7 and 1.0 deciSiemens per meter (dS/m) as a 30-day running average depending on the season, to 1.0 (dS/m) during all months of the year. The SED discounts, without significant analysis, the possibility that allowing salinity concentrations to rise in the southern Delta would have associated indirect impacts on instream temperatures and pollutant concentrations.[49] However, under current conditions waters are sometimes released by the U.S. Bureau of Reclamation to achieve the existing salinity objective and any change in this objective would therefore, ultimately impact flows, temperature and pollutant concentrations in the south Delta. The SED should analyze these impacts; particularly the challenge of attaining the dissolved oxygen objective in Old and Middle Rivers and in the Stockton Deep Water Ship Channel; achieving adequate temperatures for salmonid migration; and managing the concentration and transport of selenium through the system.

10. The proposed adaptive management framework needs greater definition and a broader range.

To be effective, the adaptive management framework needs specific decision criteria, and more clarity regarding roles and the decision making process. Effective adaptive management remains a promising concept among scientists and policy makers. However, in practice, the methodology has fallen short, due in part to inadequate application and design.[50]

The State Board should provide more detail on the annual and long-term adaptive management described in Appendix K. This includes more clearly defining the resource objectives, the roles

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EPA on February 27, 2007 and can be found at:
http://www.waterboards.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/san_joaquin_oxygen/index.shtml

[48] EPA compared the daily minimum dissolved oxygen at the Department of Water Resource's Stockton Deep Water Ship Channel monitoring station 1 meter below the surface located at Rough and Ready Island available here:
http://cdec.water.ca.gov/cgi-progs/queryF?s=sdo
with the net flow data at USGS' Garwood Bridge Station available at:
http://waterdata.usgs.gov/nwis/dv?cb_72137=on&format=gif_default&begin_date=2009-06-06&end_date=2009-06-22&site_no=11304810&referred_module=sw
Looking at data from 2007-2012, after the City of Stockton installed a nitrification system at their wastewater treatment plan, EPA concludes that excursions below the 6 mg/L criteria occur in September-November when flows are below 2,600 cfs.

[49] SED, Chapter 5

[50] "*Despite examples of the potential of an adaptive approach, contemporary examples of successful implementation are meager. In many ways, this seems paradoxical. On the one hand, adaptive management offers a compelling framework; i.e., learn from what you do and change practices accordingly. Yet, the literature and experience reveal a consistent conclusion; while adaptive management might be full of promise, generally it has fallen short on delivery. This dilemma is widely recognized (Halbert 1993, McLain and Lee 1996, Roe 1996, Stankey and Shindler 1997, Walters 1997), leading Lee (1999: 1) to conclude "adaptive management has been more influential, so far, as an idea than as a practical means of gaining insight into the behavior of ecosystems utilized and inhabited by humans*." p. 7 in Adaptive Management of Natural Resources: Theory, Concepts, and Management Institutions available at http://www.fs.fed.us/pnw/pubs/pnw_gtr654.pdf

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of the Implementation Workgroup and COG, the decision making structure, and the specific criteria that will be used to trigger management actions. The flexibility of these groups should not be so great that it undermines the proposed objective. The decision making structure should clarify the State Board's authority to avoid any appearance of transferring authority to a third party. EPA encourages the State Board to coordinate and integrate the adaptive management program developed in this Bay-Delta WQCP update with ongoing monitoring efforts such as the Inter-agency Ecological Program and the nascent Delta Regional Monitoring Program to avoid duplicating efforts by agencies and stakeholders.

Finally, the 25-45 percent range for adaptive management is too restrictive to achieve protections for aquatic life in all water year types. In critical years, FWS recommended 76 percent, 86 percent and 97 percent UF for the Tuolumne, Merced and Stanislaus Rivers, respectively, to achieve the existing Bay-Delta WQCP salmon doubling objective.[51] The range as currently proposed in the SED does not allow the flexibility to protect sensitive species during critical years.

EPA looks forward to working with the State Board as it completes its review and revises and implements the Bay-Delta WQCP.

Sincerely,

Tim Vendlinski
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Water Division

Cc:
Mark Gowdy, State Water Resources Control Board
Larry Lindsay, State Water Resources Control Board

[51] FWS 2005, pp. 27

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